PRODUCT PERFORMANCE / EFFICACY REVIEW

Mark Suarez, Entomologist - IB

20 July 2006

DATE:	20 July 2006
EPA REG. NUMBER:	279-GGRR
PRODUCT NAME:	Bifenthrin 8% ME Termiticide/Insecticide
REGISTRANT:	FMC Corp. Agricultural Products Group
PM:	George LaRocca, PM13
REVIEWER:	Bewanda Alexander
DECISION #.:	363550
DP BARCODE:	326106
ACTION:	R31
ACTIVE INGREDIENT(S):	128825, Bifenthrin.....8.0%
TYPE:	Liquid
OPPTS GUIDELINE(S):	810.1000 810.3000 810.3500 810.3600
MRID:	46725509
GLP ?:	No.
SITES:	Premises
PESTS:	GHPs, House Flies, Mosquitoes, Fire Ants, Carpenter Ants, and Termites
STUDY APPLICATION RATE:	Variable
LABEL APPLICATION RATE:	Variable

STUDY SUMMARY:

The registrant has submitted data in support of bridging data from Talstar TC to two microencapsulated emulsion, Bifenthrin 8% ME and Capture 8% ME (see EPA Reg. No. 279-GGRE). The data on their own would not be sufficient to support the registration of the public health pests listed on the label; however, this was not the intent of the submission. The data test the TC formulation side-by-side with the EM formulation (and additional formulations in some cases). Seven studies were included within the single MRID (46725509). These studies are summarized below.

MRID 46725509 Section IV. Laboratory Trial Comparing Residual Activity of Talstar® TC Flowable Termiticide/Insecticide and Bifenthrin 8% ME against House Fly Adults.

House fly adults were confined in plastic containers with cement, ceramic floor tile, or stainless steel surface treated with the test formulations, or a water control, as the bottom of the container. Each test surface was treated at a rate of 25 mg AI/m^2 (equivalent to 0.06% applied at a rate of 1 gal/1000 ft^2. Efficacy was measured at 24 hours and 4 weeks post-application. Treated surfaces were stored under greenhouse conditions with a 12L:12D light cycle. Mortality was recorded following an exposure of 24 hours.

The results indicate that under these conditions the efficacy were comparable for the standard and test formulation (Table 1).

Treatment	*Cement*		*Ceramic Tile*		*Stainless Steel*	
	25 H	*4 W*	*24 H*	*4 W*	*24 H*	*4 W*
Bifenthrin 8% ME	85	98	100	98	100	100
Talstar TC	100	100	100	100	100	100
Water (Control)	0	0	0	0	15	0

Table 1. House fly mortality resulting from exposure to treated surfaces following the application 25 mg/m^2 of Bifenthrin 8% ME and Talstar TC.

MRID 46725509 Section V. Laboratory Trial Comparing Residual Activity of Talstar® TC Flowable Termiticide/Insecticide and Bifenthrin 8% ME Against Fire Ant and German Cockroach Adults.

Adults fire ants (*Solenopsis invicta*) were confined in plastic Petri dishes with a treated surface of unfinished plywood, Thompson's water sealant treated plywood, cement, ceramic floor tile, or stainless steel surface as the bottom of the dish. Adult German cockroaches (*Blattella germanica*) were exposed to only the ceramic tile and stainless steel surfaces. Each test surface was treated at a rate of 25 mg AI/m^2 (equivalent to 0.06% applied at a rate of 1 gal/1000 ft^2. Efficacy was measured at 24 hours and 2, 8, and 12 weeks post-application. Treated surfaces were stored under greenhouse conditions with a 12L:12D light cycle. Mortality was recorded following an exposure of 24 hours.

The results indicate that under these conditions the efficacy were comparable for the standard and test formulation. The mortality observed for fire ants was 100% for all exposures was 100%, except at 2 weeks on cement (98%) and 8 weeks on ceramic tile

(98%). The mortality for German cockroaches was 100% at all observation intervals (ceramic tile and stainless steel).

MRID 46725509 Section VI. Laboratory Trial Comparing Residual Activity of Various Bifenthrin Formulations and Termidor against Carpenter Ants.

Carpenter ants (*Camponotus modoc*) were exposed to boards (unspecified type) treated with one of seven treatments (control, 0.06% Bifenthrin WP, 0.02% Bifenthrin WP, 0.02% Bifenthrin WP, 0.06% TalstarOne, 0.02% TalstarOne, or 0.06% Termidor). The application rate was not specified. Boards were sprayed an aged for 1 day, 2 months, and 3 months outdoors, under sheltered conditions. Insects were exposed to the treated surface for 3 minutes. Mortality was recorded daily for a week.

The results presented in the report were all similar, but the mortality was greater than 90% (presented only in graphical format only). However, the raw data presented in the appendix are inconsistent with the data presented in the text.

- This study does not support the desired bridging due to the deficiencies noted above (i.e., unspecified substrate and application rate; inconsistencies between reported results and raw data).

MRID 46725509 Section VII. Comparison of Activity of Bifenthrin Formulations against Adult Mosquitoes (*Anopheles quadrimaculatus*).

The subject formulation (0.06%) and Talstar 10WP (0.06%), TalstarOne (0.06%), and Demand SC (0.06%) were tested against adult mosquitoes (*Anopheles quadrimaculatus*). The formulations were applied to plant leaves at an unspecified rate. The plants were maintained under covered outdoor conditions for up to 6 weeks. Individual leaves were removed from the plant, trimmed to a standard size, and placed vertically into test chambers with 5 adult mosquitoes. Knockdown and mortality were recorded at 5, 15, 30, and 60 minutes and 4 and 24 hours. The 24 hour mortality resulting from exposure was similar across treatments (>90%) at 1 DAT and 4 and 6 WAT. Mortality in the ME formulation treatments was 100% at for all three times.

- This study does not support the desired bridging due to the deficiencies noted above (i.e., unspecified application rate).

MRID 46725509 Section VIII. Effect of Soil Treated with Bifenthrin Formulations on Termite Workers.

The subject formulation, TalstarOne, and Capture EC were tested against the subterranean termites (*Reticulitermes flavipes* and *Coptotermes formosanus*). The formulations were applied to loamy sand soil to produce a final concentration 60 ppm AI in the soil. Petri dishes were filled with a thin layer of the soil and populated with 10 termites per replicate. The number of replicates reported in the study is 4, but only 3 are apparent from the raw data. Also, the study report indicates that 10 workers were used in each replicate, but the raw data indicate that 25 individuals were used. In *Reticulitermes* trials all replicates for all treatments demonstrated >90% mortality. After 2 days

exposure all treatments resulted in 100% mortality. In *Coptotermes* trials, all treatments failed to result in adequate mortality until day 5, at which point 100% mortality was observed. Control mortality was acceptable in both trials.

Despite the inconsistencies listed, these data do demonstrate that the formulation kills termites in a manner similar to the currently registered termiticide under controlled laboratory conditions.

MRID 46725509 Section IX. Effect of Soil Treated with Bifenthrin Formulations on Termite Tunneling.

The subject formulation and Capture EC were tested in a study designed to evaluate the repellency of the formulations against subterranean termites (*Reticulitermes flavipes*).

- No evaluation of the data is provided herein because the reference formulation used (Capture EC) is not registered for use as a termiticide. Therefore, the comparison is not valid for the purposes of bridging.

ENTOMOLOGIST'S COMMENTS AND RECOMMENDATIONS:

The submitted data are adequate to support the bringing of data between the Talstar ® TC flowable and the subject formulation – despite the deficiencies noted in studies VI, VII, VIII, and IX. The data submitted are viewed as confirmatory. All claims against public health pests currently approved on the Talstar ® TC label (EPA Reg. No. 279-3206) may be included in the label for the desired registration.

The data submitted provide support for neither modification to the directions for use (including termiticide DFU and application rates) nor the addition of pest or marketing claims beyond those currently supported on the Talstar ® TC label.

Specific label comments are provided below:

1. Remove the following claims not present on the reference label:
    a. Bifenthrin 8% ME will provide up to 1 month residual control of house flies. Length of residual control is dependant upon rate and surface treated.
    b. Bifenthrin 8% ME will kill fleas for up to 3 months.
    c. Under Mosquito Control remove:
        i. "Use of this product for control of urban mosquitoes that may potentially transmit malaria, dog heartworm, and arboviruses such as, but not limited to West Nile fever, dengue fever, Eastern equine encephalitis, and St. Louis encephalitis."
    d. Under "Subterranean Termite Control" the statement "Where probability of termite attack is low…in northern states."

2. Modify the following label text to avoid confusion:

a. The heading "Termite Control (above Ground Only)" to read "Termites (Above Ground Only)" and modify the text in that section by removing all reference to control and replacing with kill, including:
    i. To ~~control~~ kill exposed workers…
    ii. To ~~control~~ kill above-ground termites…
    iii. To ~~control~~ kill termites in carton nests…
b. Under "Subterranean Termite Control" reorganize the section so that the advisory language beginning "The use of this product prevents and controls Termite infestations in and around… state cooperative extension and regulatory agencies" Is located immediately ahead of the directions for the application rate.

Enclosure
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